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|  MOTION IMAGERY STANDARDS BOARD | MISB ST 0901.2 |
| STANDARD | |
| Video-National Imagery Interpretability Rating Scale | 27 February 2014 |

1 Scope

MISB Standard 0901 documents the Video NIIRS, a subjective quality scale for rating the intelligence value of airborne motion imagery in the visible spectrum. The document includes some background of the scale's design, brief instructions in its use, recommendations for its employment, and the scale itself.

This version of ST 0901 consists of a re-numbering of the scale. The change designates the Video NIIRS levels to be numbered from two to eleven instead of the previous zero through nine. This change aligns the Video NIIRS spatial characteristics to match still frame EO (Electro-Optical) NIIRS and the NGA Image Quality and Utility Program (NIQU) mandate that all NIIRS levels five are characteristic of 20.8 inches ground Sample Distance (GSD). Instructions for the employment of the scale (section 4.4) have been updated to better address the rating environment.

2 References

2.1 Normative References

N/A

2.2 Informative References

- [1] ITU-R BT.500-13 Methodology for the subjective assessment of the quality of television pictures, Jan 2012
- [2] MISB Motion Imagery Standards Profile (MISP 6.6), Feb 2014
- [3] Young, D.L., Yen, J., Petitti, F., Bakir, T., Brennan, M., Butto Jr, R., "Video National Interpretability Rating Scale Criteria Survey Results", SPIE Defense, Security, and Sensing Conference, Orlando, FL, April, (2009)
- [4] Leachtenauer, J.C., Driggers, R., "Chapter 5: Information Extraction Measures", [Surveillance and Reconnaissance Imaging Systems], Artech House, pg. 132 (2001)

- [5] Vaughan, Barry, D. ,”Soldier-in-the-Loop Target Acquisition Performance Prediction Through 2001: Integration of Perceptual and Cognitive Models” Army Research Lab Technical Report, ARL-TR-3833, July, (2006)
- [6] Irvine, J.M., Fenimore, C., Cannon, D. Roberts, J. Israel, S., Simon, L., Watts, C., Miller, J.D., Brennan, M., Aviles, A. I., Tighe, P. F., Behrens, R.J., “Feasibility Study for the Development of a motion Imagery Quality Metric”, 33rd Applied Imagery and Pattern Recognition Workshop: Image and Data Fusion, IEEE computer Society, Washington, October (2004)
- [7] Irvine, J.M., Fenimore, C., Cannon, D. Roberts, J. Israel, S., Simon, L., Watts, C., Miller, J.D., Brennan, M., Aviles, A. I., Tighe, P. F., Behrens, R.J., “Factors Affecting Development of a Motion Imagery Quality Metric”, SPIE Defense and Security Symposium, Orlando FL, March (2005)
- [8] Fenimore, C., Irvine, J.M, Cannon, D., Robert, J., Aviles, I., Israel, S., Brennan, M., Simon, L., Miller, J. D., Haverkamp, D., Tighe, P.F., Gross, M., “Perceptual Study of the Impact of Varying Frame Rate on Motion Imagery Interpretability”, SPIE Conference on Human Vision and Electronic Imaging, XI, SPIE 6057-17, January, (2006)
- [9] Irvine, J.M., Cannon, D., Miller, J. D., Bartolucci, J., O’Brien, G., Gibson, L., Fenimore, C., Roberts, J., Aviles, I., Brennan, M., Bozell, A., Simon, L., Israel, S., “Methodology Study for Development of a Motion Imagery Quality Metric”, SPIE Defense and Security Symposium, Orlando, FL, 17-21, April, (2006)
- [10] Irvine, J.M., Fenimore, C., Cannon, D., Haverkamp, D., Roberts, J., Israel, S., Simon, L., Miller, J, Aviles, A., Brennan, M., “Development of a Motion Imagery Quality Metric”, Proceedings of the American Society for Photogrammetry and Remote Sensing Annual Meeting, Reno Nevada, May, (2006)
- [11] Irvine, J.M., Fenimore, C., Cannon, D., O’Brien, G., Roberts, J., Israel, S., Miller, J, Aviles, A., “Quantifying interpretability for motion imagery: Applications to image chain analysis”, Information Fusion, 2007 10th International Conference on, p. 1-8, July (2007)
- [12] Young, D. L., Bakir, T., Pettiti, F. V., Brennan, M., Kavanagh, C., Butto, R., “Color in Perceptual Tracking using Low Frame Rate Motion Imagery”, SPIE Defense and Security Symposium, Orlando FL, March, (2008)
- [13] Trochim, William M., “The Research Methods Knowledge Base”, 2nd Web Edition <http://www.socialresearchmethods.net/kb/>,(2009)
- [14] Baily, H.H., “Target Acquisition Through Visual Recognition: An Early Model”, Target Acquisition Symposium, Orlando, Florida, 14-16,, November, (1972)
- [15] Agresti,, A. S., [Introduction to Categorical Analysis], Wiley Series in Probability and Statistics, pg 7-12 (1996)

3 Acronyms

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|-------------|--------------------------------|
| EO | Electro-Optical |
| FMV | Full Motion Video |
| GSD | Ground Sample Distance |
| LVSD | Large Volume Streaming Data |
| MISB | Motion Imagery Standards Board |

MIQM Motion Imagery Quality Metrics
NIIRS National Imagery Interpretability Rating Scale
OB Order(s) of Battle
WAPS Wide Area Persistent Surveillance

4 Revision History

| Revision | Date | Summary of Changes |
|-----------|------------|--------------------------|
| ST 0901.2 | 02/27/2014 | • Promoted to a Standard |

5 Introduction

This document is intended to offer the means to provide human ratings of the intelligence value of airborne motion imagery in the visible spectrum. The capability provided herein is the subjective rating scale (Video-NIIRS) and instructions for its use.

6 Video National Imagery Interpretability Rating Scale (Video-NIIRS)

This documents the subjective quality scale for airborne motion imagery in the visible spectrum. When used in this context, ‘quality’ refers to interpretability, or the intelligence value of a video (or motion imagery) clip. This is not a measure of esthetic value. The Video-NIIRS is designed to account for differences in resolution, sampling rate (frame-rate), scene complexity, and human activity or behavior.

6.1 Scale Design

The Video-NIIRS is designed to be log-linear in resolution space, meaning that each successive Video-NIIRS level from two (lowest) to eleven (highest) represents a halving of ground sampling distance (i.e., doubling the resolution from Video-NIIRS 4 to Video-NIIRS 5, to 6, and so on). This document provides criteria tasks for seven Orders of Battle or Content Domains: Air Forces, Ground Forces, Electronics, Missile, Naval Forces, Culture, and Security. Some Video-NIIRS levels have more than one criterion example per Order of Battle/Content Domain.

6.2 Criteria Structure

Each of the written criteria contains specific components separated by a dash to add clarity and aid readers understanding of the content. These components are arranged as follows for each criterion:

- Analyst Task (*Verbs like ‘track’ or ‘confirm’ infer an analyst’s ability to do so consistently over an ensemble of clips of equal quality*)
- Object of Interest
- Associated Activity or Behavior

- Environment
- (Object Reference Examples)

The analyst rates a motion imagery clip by determining if he or she can perform the most relevant criteria listed for a particular Video-NIIRS level, but cannot do the same for the next higher level. (i.e., “One can perform the Video-NIIRS 4 criteria on a clip, but not the Video-NIIRS 5 criteria. One rates the video clip Video-NIIRS level 4”).

6.3 Using the Video-NIIRS in Analyst Evaluations

It is recommended that analyst Video-NIIRS ratings be given in whole number integers only, as this is a measure of interpretability (intelligence value) only. The ability (or inability) to perform the tasks provided in Video-NIIRS criteria is an absolute. One either can, or cannot; therefore the rating should be a whole number. There can and will be significant differences in the visual preferences one may have over video of the same Video-NIIRS rating level. While these preferences may be undefined, they are, by definition, not measures interpretability. They do however represent human factors that can impact the quality of analysis and should be addressed.

These undefined visual preferences are not task based and can be assessed in quality studies using The Double Stimulus Continuous Quality Scale Method described in ITU-R BT.500 [1] Methodology for the Subjective Assessment of Quality of Television Pictures. Any study using Video-NIIRS to extract analyst ratings that are fractional or decimal in nature may not meet the criteria for construct validity.

6.4 Rating Quality Using the Video-NIIRS

It is recommended that when providing general quality ratings of a video clip, the rater analyzes and addresses the quality closest to the center of the motion imagery frames, especially in the range direction. Severe obliquity and extreme slant range increases the variability of Video-NIIRS quality within the field of view (FOV); therefore subjective ratings are more repeatable for airborne video clips collected closer to nadir.

Motion imagery is a dynamic medium and intervention of the camera operator is continuous. Therefore resolution (zoom) and modalities can change often over the course of an observation. The user’s VNIIRS rating should be indicative of a stable clip section from which the relevant intelligence is extracted. Stable clip sections typically range from a few seconds to 10 seconds in duration for FMV, longer for WAMI.

Unless otherwise noted, the mention of a specific object-of-interest in the Video-NIIRS criteria presumes the motion imagery has the spatial resolution required to categorize the object based on its morphology alone. Video-NIIRS criteria tasks such as ‘track’ or ‘confirm the movement’ presume that the motion imagery has the temporal resolution (frame rate or sampling rate) to reliably perform the stated analyst function.

In the course of collecting airborne motion imagery there will be cases, such as surveillance of an empty street, when no movement or behavior is evident simply because nothing is going on in the FOV. In these cases an analyst will need to provide a quality rating based on what they

should be able to do. The lack of any movement or activity in a full motion video scene does not degrade motion imagery quality.

6.5 Motion Imagery - Definition

Motion Imagery is defined as imagery [a likeness or representation of any natural or man-made feature or related object or activity] utilizing sequential or continuous streams of images that enable observation of the dynamic, (temporal), behavior of objects within the scene. Motion Imagery temporal rates, nominally expressed in frames per second, and must be sufficient to characterize the desired dynamic phenomena. Motion Imagery is defined as including metadata and nominally beginning at frame rates of 1 Hz (1 frame per second) or higher within a common field of regard. Full Motion Video (FMV) falls within the context of these standards.

- MISP[2]

7 Video-NIIRS Criteria by Quality Level

VIDEO-NIIRS Level Two

At Video-NIIRS Two, motion imagery data lacks sufficient spatial and/or temporal resolution for intelligence surveillance; for example, high EO-NIIRS still imagery would be rated Video-NIIRS two regardless of spatial resolution, as it provides no dynamic content. High frame-rate video of a resolution too low to discern most human activity would be rated Video-NIIRS two because it provides insufficient spatial content.

Assuming a suitably wide Field of View, gross spatial and temporal resolution motion imagery data could support monitoring of commercial sea-lanes (tracking tankers and other large surface ships) as well as conducting macro-pattern analysis of populated regions. Such data may also support dynamic Earth Sciences such as oceanography and meteorology

Order of Battle

VIDEO-NIIRS LEVEL 3

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| AIR FORCES | Track movement of - an identified Heavy Cargo/Passenger Aircraft - during taxi or tow - at a primary airfield/airport installation. - (Aircraft Length: 50m plus, MD11, A300, B747, B767, DC8) *Note – under-resolved smaller aircraft may be evident based on movement or behavior |
| ELECTRONICS | Track the movement of - a convoy of unidentified radar/radar support vehicles - in column formation or road march - traveling on an open roadway in the vicinity of a known EW or SAM radar site - (4 to 8 vehicles with total column length 50m plus) *Note – vehicles comprising the convoy and other under-resolved vehicles are evident based on movement or behavior |
| GROUND FORCES | Track the movement of - an unidentified military convoy of company size or larger consisting of armor or mechanized infantry- in a column or "road march"- on an open highway/roadway- (4 to 8 vehicles with total column length 50m plus) *Note – vehicles comprising the convoy and other under-resolved vehicles are evident based on movement or behavior |
| MISSILE | Track the movement of - Convoy of intercontinental ballistic missile (ICBM) transporter and support vehicles - during deployment or road march - on an improved road near missile base, launch site or silo - (Dong Feng 4, Taepodong 2, Agni V: transporter with support vans - convoy length 60m or more) *Note – Support vehicles comprising the convoy and other under-resolved vehicles may be evident based on movement or behavior |

- NAVAL FORCES** Track the movement of - an unidentified coastal patrol craft - conducting normal operations - at sea several miles beyond a harbor or port - (US Cyclone Class: average 58m length, 8m beam)
*Note – under-resolved smaller craft may be evident based on movement behavior, or wake
- CULTURE** Track the movement of - an oversized heavy hauler tractor & trailer - driving in a convoy - on the open highway - (Movers of houses, cranes, drilling and large earth moving equipment: 100 Ton big-rig tractors with multi-axle lowboy special use trailer, total length 40m to 50m)
*Note – under-resolved smaller trucks may be evident based on behavior
- CULTURE** Track the movement of - an oversized container carrying flatbed railcar - in motion - at a rail yard - (46m length flatbed rolling stock)
* Note – under-resolved smaller trucks or rolling stock may be evident based on behavior.
- SECURITY** Track the movement of - an unidentified convoy of 3 or more sea/land containers - driving in a column formation - exiting a rail yard or port facility - (big-rig tractors hauling Sea/Land Containers total convoy length 50m or more)
*Note – under-resolved smaller trucks may be evident based on behavior

Order of Battle

VIDEO-NIIRS LEVEL 4

- AIR FORCES** Track movement of - an identified Large Fighter/Attack Aircraft - during taxi or tow - at a primary airfield/airport installation - (Aircraft Length: 15m plus, F15, F16, Eurofighter, F22, MIG29, F35)
*Note – Under-resolved smaller aircraft may be evident based on movement or behavior
- AIR FORCES** Confirm Rotor Wash Effects of - an Unidentified Light/Medium Helicopter on tall grass, sand, or dirt - during take-off or landing - in the field, at a tactical Landing Zone (LZ) or Forward Arming and Refueling Point (FARP) - (Diameter of disturbance: 25m to 50m)
*Note – the helicopter causing rotor wash, as well as other under-resolved aircraft or ground support vehicles may be evident based on movement or behavior
- ELECTRONICS** Confirm movement of - large EW radar or signal intercept vehicles and vans with trailers - in column/convoy or deploying - at or near a known improved electronics site - (Large flatbed tractor-trailer with mast mounted antennas: 20m vehicle length)

*Note – under-resolved smaller vehicles (vans or cars) may be evident based on behavior.

**GROUND
FORCES**

Track the movement of - individual, tracked engineering vehicles and wheeled prime mover/trailer combinations - during tactical road march/deployment - in the field or on an unpaved road - (engineer recovery vehicles, scissor bridges, tank carriers: avg. length 15m - 25m)

*Note – under-resolved smaller vehicles (light trucks, support vehicles) may be evident based on behavior.

MISSILE

Track the movement of - an individual Intercontinental ballistic missile (ICBM) - while being transported overland - on an improved road near missile base, launch site or silo - (Dong Feng 4, Taepodong 2, Agni V: airframe length approx. 20m to 30m)

*Note – under-resolved smaller support vehicles may be evident based on behavior.

**NAVAL
FORCES**

Track the movement of - an unidentified small near-shore or inter-coastal patrol boat - conducting normal operations - in the coastal or near-shore littoral environment - (US Mark V Special Ops Craft: approx 85ft length, 6m beam)

*Note – under-resolved smaller boats may be evident based on movement behavior, or wake

**NAVAL
FORCES**

Track movement of - an identified Large Fighter/Attack Aircraft - during shipboard air operations - on the deck of an attack aircraft carrier - (Aircraft Length: 15m plus, F18, Harrier, F35)

*Note – Under-resolved smaller aircraft or deck handling equipment may be evident based on movement or behavior

CULTURE

Track the movement of - a large freight/transport vehicle type: 18-wheel tractor-trailer rig, metro-bus, large RV - driving independently - on an urban road in light traffic - (commercial freight & public transports: 15m to 23m length)

*Note – under-resolved smaller vehicles (cars, SUV) may be evident based on behavior.

SECURITY

Track the movement of - an individual sea/land container tractor-trailer rig - driving independently - on an highway in light traffic - (commercial freight transports: 15m to 23m length)

*Note – Under-resolved smaller vehicles (cars, SUV) may be evident based on movement or behavior

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| AIR FORCES | <p>Confirm rotation of - Main Rotor Blades on an Identified Medium Helicopter - during warm up or taxi - at a primary airfield/airport installation - (Rotor-blade Diameter: 12m to 18m, RAH66, KA50, AH64, NH90, UH60)</p> <p>*Note – under-resolved ground crew or grouped dismounts may be evident based on movement or behavior</p> |
| ELECTRONICS | <p>Confirm movement of - a large electronics vehicle's mast and mast mounted antenna - while being raised or lowered - at a known improved electronics site - (Vehicle/trailer mounted mast and antenna: mast height 20m plus)</p> <p>*Note – Under-resolved crew-members or grouped dismounts may be evident based on movement or behavior</p> |
| GROUND FORCES | <p>Confirm the rotation of - the turret on a main battle tank - as the main gun slews during training, live fire exercise, or combat - at a gunnery range, field deployment site, or battle zone - (M1-A2, Challenger-2, Leopard-2, T-80: average chassis 9m long by 3.5m wide)</p> <p>*Note – Under-resolved dismounts may be evident based on movement or behavior</p> |
| MISSILE | <p>Track the movement of - an individual mobile short range ballistic missile (SRBM) or large artillery rocket - while being transported or during launch preparations - on or near a road, in the vicinity of a surveyed launch site - (mobile Fajr-5 or SCUD: airframe length approx. 10m - 15m)</p> <p>*Note – Under-resolved dismounts may be evident based on movement or behavior</p> |
| NAVAL FORCES | <p>Track the movement of - a light riverine/deep inter-coastal patrol boat - during operations/patrol - in the riverine environment - (light patrol boat, or rigid inflatable boat "RIB": 8m to 11m length, 2.5m to 3m beam)</p> <p>*Note – Under-resolved personal water-craft or swimmers may be evident based on movement, behavior, or wake</p> |
| CULTURE | <p>Track the movement of - a car, SUV, van, or light truck- driving independently - on roadways in medium traffic - (mid & full size cars & trucks: 5m - 6m length)</p> <p>*Note – under-resolved 2-wheeled vehicles or dismounts may be evident based on movement or behavior.</p> |
| SECURITY | <p>Track the movement of - a suspect car, SUV, or light truck- driving erratically/aggressively or employing evasive driving measures - on roadways in light traffic - (mid & full size cars & trucks: 5m - 6m length)</p> <p>*Note – under-resolved 2-wheeled vehicles or dismounts may be evident based on movement or behavior.</p> |

Order of Battle

VIDEO-NIIRS LEVEL 6

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| AIR FORCES | Confirm movement of - control surfaces on an Identified heavy cargo/passenger aircraft - during preflight checkout or taxi - at a primary airfield/airport installation - (Flaps & ailerons on aircraft having wingspan of 112m plus, MD11, A300, B747, B767, DC8) |
| ELECTRONICS | Confirm movement of - a vehicle or building mounted parabolic mesh antenna - as it slews or rotates - at a known improved electronics site - (Parabolic mesh antennas, approximate diameter of 30ft) |
| GROUND FORCES | Confirm the movement/operation of - crew served or vehicle mounted anti-aircraft systems - as the launchers/guns slew to an aimed firing position during operation - at a revetted, defensive field position - (Avenger, Tunguska M1, Rapier: launcher pods average 2m - 3m length) |
| MISSILE | Confirm the movement of - vans, cranes/hoists supporting a mobile short range ballistic missile (SRBM) - during maintenance, trans-loading, deployment preparation - at a garrison or field maintenance facility - (support vans & equipment lengths approx. 3m to 5m) |
| NAVAL FORCES | Confirm the movement of - deck mounted defensive armament - as it slews and elevates to aim and fire - on a surface combatant, cruiser or frigate - (20mm & 40mm guns and mounts/turrets: average diameter 5m to 6m) |
| CULTURE | Track the movement of - a full sized motorcycle - driving independently - on roadways in medium traffic - (large cruising motorcycle, 2.5m length) *Note – under-resolved dismounts may be evident based on behavior. |
| SECURITY | Track the general movement of - of groups (25+) of under-resolved dismounts - as they cross the street - at a busy intersection in an open public square or pedestrian thoroughfare - (commuters, shoppers, or event participants) |

Order of Battle

VIDEO-NIIRS LEVEL 7

- AIR FORCES** Confirm the movement of - control surfaces on an Identified light transport aircraft - during preflight checkout or taxi - at a International or Municipal airfield/airport installation - (Flaps & ailerons on aircraft having wingspan of 18m or less, Beech Model 200 Super King Air, flaps approx. 0.75m wide by 2.5m long)
- AIR FORCES** Confirm heat distortion waves/effects from - the exhaust plume of a large fighter jet - during warm up or taxi - at a secondary/dispersal airfield - (Diameter of visible distortion approx. 5m to 10m)
- ELECTRONICS** Confirm movement of - large access panels - as they are opened or closed - on a site or field deployed electronics/radar van or mobile hut - (Individual panels of 2m - 2.5m diameter)
- GROUND FORCES** Confirm the movement/operation of - crew served or vehicle mounted anti-armor weapons - as the launcher is aimed or slews to its firing position during live fire exercise or combat - at a gunnery range, field deployment site, or battle zone - (TOW 2, Milan, Javelin: launcher 1m -1.5meters length)
- MISSILE** Confirm the movement of - the crew supporting a mobile short range ballistic missile (SRBM) - during maintenance or launch preparations - at a maintenance facility or launch site - (Individuals of average height and weight)
- NAVAL FORCES** Confirm the movement of - unidentified deck-borne objects -as they are dumped over the side or stern - of any surface ship or fishing vessel at sea - (container drums, bales, crab traps: 2m to 2.5m diameter)
- CULTURE** Confirm the movement of - a car hood/bonnet or deck-lid/trunk/boot - as it is opened or closed - while stopped along a roadway or street - (conventionally hinged midsize car hood or deck-lid)
- SECURITY** Isolate pockets of unrest/potential violence - in large groups (50+) of otherwise peaceful dismounts - as they demonstrate or protest - in an open public square or pedestrian thoroughfare - (political demonstrators, bystanders, observers, security forces)

Order of Battle

VIDEO-NIIRS LEVEL 8

- AIR FORCES** Confirm the movement of - individual Pilot(s) or Flight crew - conducting external pre-flight checkout - at a tactical/dispersal airfield or forward operating base - (Individuals of average height and weight)

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| ELECTRONICS | Confirm movement of - individual crewmembers - entering or exiting hatches or climbing ladders - on a site or field deployed electronics/radar van or mobile hut - (Individuals of average height and weight) |
| GROUND FORCES | Confirm the movement of - an individual holding a shoulder fired anti-aircraft missile - as the launcher is raised to the aimed firing position - in the field, in a defensive position, or in the vicinity of an airfield or airport approaches - (Stinger, SA-16/18-IGLA: launch tube avg. 1.7m length) |
| MISSILE | Track the movement of - an individual member of a Katyusha rocket crew - during transportation and deployment - enroute/near a launch site - (Individuals of average height and weight) |
| NAVAL FORCES | Confirm the movement of - individual deck crew handling seaborne mines - as they are readied for deployment off the stern -of any surface ship/boat, esp. a non-combatant modified/co-opted for terrorist or military use - (seaborne mines, approximate 1m in diameter) |
| CULTURE | Confirm the movement of - a car-door - as it is opened or closed - while stopped along a roadway or street - (conventionally hinged midsized car door) |
| SECURITY | Isolate and track the movement of - small subgroups (associates) in a larger crowd of people - as they walk - in an open public area or pedestrian walkway - (subgroups of 2 to 5 individual pedestrians in a crowd of 20 or more, based on movement and proximity) |

Order of Battle

VIDEO-NIIRS LEVEL 9

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| AIR FORCES | Consistently track the movement of - the body & arms of ground/flight crew member - hand lock/unlock an external panel, hatch or compartment on any aircraft - at any airfield or base - (individuals of average height and weight) |
| ELECTRONICS | Consistently track the movement of - an individual's body & arms - while using an unidentified portable handheld communications device - in an open public area or pedestrian walkway - (Individual of average height & weight holding device up to ear, or bringing hands together for text-entry) |
| GROUND FORCES | Consistently track the movement of - the body & arms of an individual holding a long rifle or sniper rifle -as the weapon is raised to an aimed firing position -either standing, sitting, or prone - At a practice range, during live fire exercise, or during an engagement - |

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| | (Barrett M82-A1, Remington Model 700 series, etc: 1m to 2m overall length) |
| MISSILE | Consistently track the movement of - an individual Katyusha crew member's body & arms -during set up and launch preparation - at a tactical launch site in a rural or urban environment - (Individuals of average height and weight) |
| NAVAL FORCES | Consistently track the movement of - an individual deck crew's body & arms - as they conduct a patrol or operations - on a light surface combatant / patrol boat - (individual of average size and weight) |
| CULTURE | Consistently track the movement of - a pedestrian's body and arms - as they walk - in a busy public area, market, or walkway - (individual of average height & weight) |
| SECURITY | Confirm a conversation is underway based on the movement of - the body and arms of participants - as they walk or stand - in an open public area or pedestrian walkway - (subgroups of 2 to 3 individual pedestrians speaking among a meandering crowd of 20 or more) |

Order of Battle

VIDEO-NIIRS LEVEL 10

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| AIR FORCES | Confirm the movement of - the hands & forearms of a ground crew/mechanic using an identified hand tool or power tool - while servicing any aircraft or support vehicle - at any airfield, base, or aircraft maintenance facility - (Individual of average size using socket wrench or power driver with length of 0.15m to 0.3m) |
| ELECTRONICS | Confirm movement of - an individual's hands & forearms holding a visible handheld communications device - in the process of sending/receiving information speaking, text-messaging, etc. - in an busy public area or pedestrian walkway - (Cell phone or PDA avg. diameter: 0.1m-0.15m) |
| GROUND FORCES | Confirm the movement of - the hands and forearms of an individual holding a compact assault weapon or large frame handgun -as the weapon is raised to an aimed firing position - either standing, crouched, or prone - At a practice range, during live fire exercise, or during an engagement - (MP-5, AK74, Colt Commando, UZI, M-1911: 0.25m to 0.8m overall length) |
| MISSILE | Confirm the movement of - an individual Katyusha crew member's hands & forearms - while connecting leads/wires between rockets and trigger mechanism - at a tactical launch site in a rural or urban environment - (Individuals of average height and weight) |

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| NAVAL FORCES | Confirm the movement of - individual deck crew member's forearms & hands - as they perform weapons check of pedestal mounted arms - on a patrol boat in a riverine environment - (individual of average size and weight manning a mounted .50cal or MK19 grenade launcher) |
| CULTURE | Confirm the movement of - a pedestrian's forearms and hands - as they make a purchase from a street vendor - in a busy open market or square - (individual of average height & weight, exchanging payment for goods) |
| SECURITY | Confirm an individual is speaking based on the movement of - an individual's head and mouth - as they engage in a conversation - in an open public area or pedestrian walkway - (determine if a person is speaking based on head and mouth movement) |
| SECURITY | Confirm the movement of - an individual's forearms and hands - as they gesture or sign - in an open public area or pedestrian walkway - (confirm/read gestures or body language while subject is conversing, or partially interpret sign language) |
| SECURITY | Confirm the functions of individuals based on the movement of - body, head, forearms, and hands - as a protected individual is moved - to or from a vehicle/motorcade or in an open public area - (isolate behavior to determine the function of individuals in a small group: armed security, principals, VIP) |
| SECURITY | Confirm the exchange of a parcel based on the movement of - the hands and forearms of 2 individual pedestrians - as one walks past the other - in a crowded public area or pedestrian walkway - (confirm the exchange of a letter sized envelope between two pedestrians in a crowd) |

Order of Battle

VIDEO-NIIRS LEVEL 11

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| AIR FORCES | Confirm the movement of - the fingers/hand of a ground crew/mechanic changing the socket on a ratchet/socket wrench - while servicing any aircraft or support vehicle - at any airfield, base, or aircraft maintenance facility - (Socket able to fit in palm of workers hand) |
| ELECTRONICS | Confirm movement of - an individual's mouth/jaw - while speaking into a Bluetooth wireless mobile phone earpiece - in an crowded public area or pedestrian walkway - (average sized person wearing an over the ear device with internal or boom microphone, avg. diameter: 2.5 to 5.0 centimeters) |

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| GROUND FORCES | Confirm the movement of - the fingers and hands of an individual holding a fragmentation grenade - as the weapon's safety is released and the device is readied - at a practice range, during live fire exercise, or during an engagement - (spherical or cylindrical device, palm sized with metal pull ring/pin and spring loaded safety lever: 6cm - 8cm diameter) |
| MISSILE | Confirm the movement of - individual's fingers and hands while aiming a shoulder fired anti tank missile - as they release safeties and arm the device - at a tactical position in a rural or urban environment - (Individuals of average height and weight holding AT-4 or RPG) |
| NAVAL FORCES | Confirm the movement of - an individual combat swimmer's hands and fingers - as they check out and test scuba equipment - on a light surface combatant, patrol boat near the littoral zone - (individual of average size and weight) |
| CULTURE | Confirm the movement of - a pedestrian's hands and fingers - as they make change or sort coins - in a busy open market or square - (individual of average height & weight, sorting coins in a change purse or the palm of one hand) |
| CULTURE | Confirm the movement of - a pedestrian's hands and fingers - as they communicate through sign language - in an open public area - (fully interpret sign language to include the spelling out of individual letters) |
| SECURITY | Isolate and investigate an individual or group based on the movement of - their hands, fingers, and face - as they observe the movement of a protected individual - from a crowd, behind a rope line or police barrier - (isolate behavior to determine if an individual or individuals pose an immediate threat to a VIP) |
| SECURITY | Isolate and investigate an individual apparently burdened with significant concealed weight, based on their gait - their posture, hands, fingers, and overall body language - as they meander into a crowd - in a public square, market, or shopping mall - (based on gait, determine if an individual is a public threat, concealing an explosive vest or belt) |
| SECURITY | Isolate suspicious movement/behavior of - the hands and fingers of a suspect individual or known operative - as they leave an inconspicuous signal or message - on a light pole or mailbox in a crowded urban street - (traditional espionage tradecraft: a chalk mark or sticker on a predetermined location to signal a meeting or dead-drop) |